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IBM'S OA PUZZLE

THE REAL COST OF OA

EDS VS. XEROX & GM

COMMON SENSE & NETWORK SECURITY

DATAMATION

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COVER ILLUSTRATION BY DOUG TAYLOR

The cost of automating office work is a matter of people, not machines.

THE REAL COST OF OA

by Paul A. Strassmann

Installing information technology in the office implies a much greater expense than just buying workstations. Extensive resources are required to support an electronic workstation before it can be put to productive use, and the most costly elements of such support are not technological but organizational.

The issue is not whether a cell of magnetic memory costs .001 cents or .000001 cents. The only valid way of looking at the economics of information technology is in terms of its utility.

There is a fallacy in the reasoning that somehow cheap computer power makes it very desirable to use a great deal of it. Investments in information technology must meet the same stringent criteria of justification as any other investment. Costs are important but secondary.

The most frequently used reasoning to justify purchases of information technology goes as follows: labor expenses are high and getting higher; computer expenses are low and getting lower; it then logically follows that one should always trade an expensive commodity, e.g., labor, for an inexpensive commodity, e.g., computers.

On the surface, this simple reasoning leads to inescapable conclusions. Let us examine it a bit closer by analyzing Fig. 1, a lucid representation of this point of view representing the payout ratio for a workstation in dollars per year.

The central message here is that a rapidly declining payout ratio makes the purchase of information technology increasingly attractive. At 11% of labor cost, it should be much easier in 1990 to achieve payoff from an investment than in 1970 when the payout ratio was 91%. Interestingly, the lowered threshold of financial pain for making office automation investments is not driven primarily by the 38%

ILLUSTRATION BY ANDREA BARUFFI

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Organized labor is becoming keenly aware of the negotiating leverage that mismanaged OA projects hand over to them.

reduction in the annual workstation expenses from $9,100 to $5,600. It is the increased inclusion of expensive professionals and managers in the labor cost, against which savings are counted, that makes the entire proposition so attractive.

The payout ratio is up because the labor costs considered eligible for automation are up by 500%. Management should not ask how information technology delivers the payoff. Management should ask how changed patterns of office work will deliver the promised benefits.

The economics of providing a workstation to managerial and professional personnel are far more complex than making a simple decision concerning the purchase of an electronic appliance or a machine tool (see Fig. 2). Less than 20% of the total first-year cost of equipping an administrator or professional with a workstation involves equipment depreciation. In the case shown in Fig. 2, equipment depreciation includes five-year amortization of an $8,000 terminal plus maintenance charges. Since an $8,000 device is not adequate to fully support office applications needed to aid the work of administrators and professionals, the personal workstation must draw on shared resources, like departmental files and high-performance printers for graphic output. The individual also must have access to communications controllers to connect to others in or outside the office building. Costs are also incurred in purchasing supplies such as paper, local magnetic storage disks, printwheels, cabling, and so on.

For a workstation to be useful, it must be connected to other workstations as well as to other networks. Telecommunications expenses of at least $1,500 include not only telephone line and instrument charg-

FIG. 1

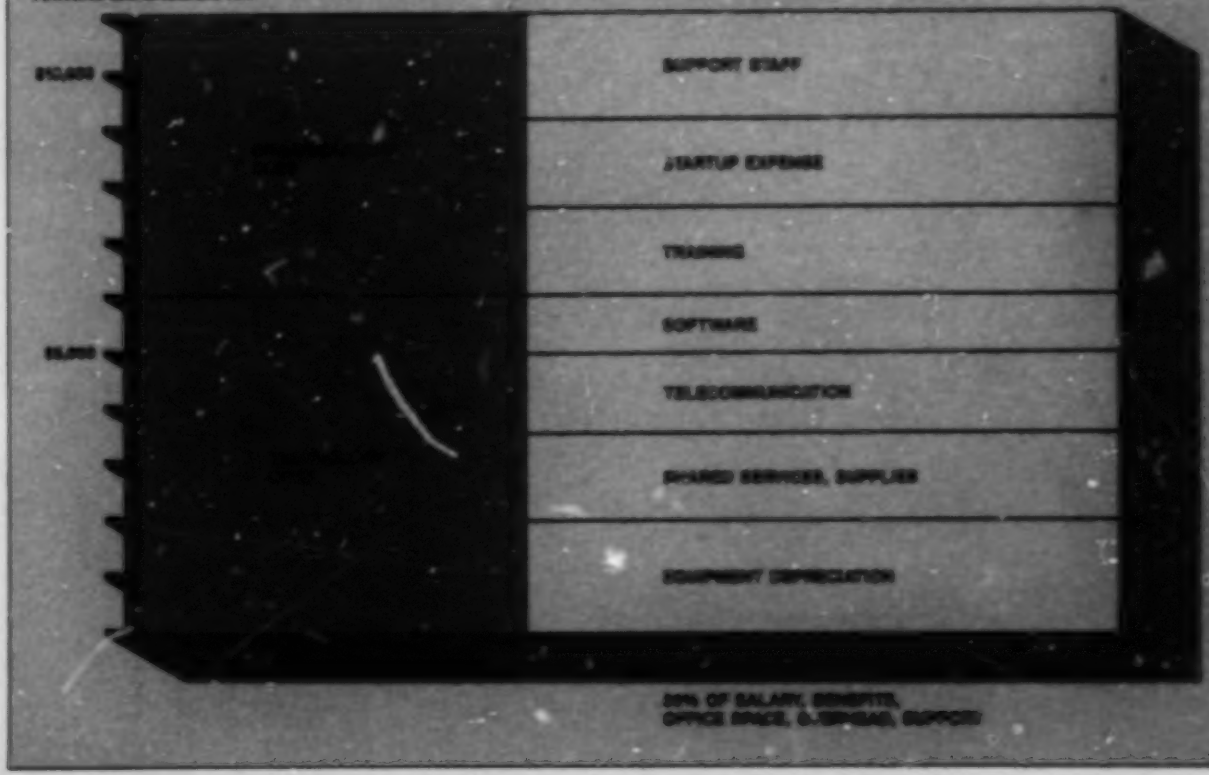
PAYOUT RATIO FOR WORKSTATION

	1979	1980	1985
Technology cost	$9,100	$8,600	$5,600
Labor cost	$10,000	$20,000	$50,000
Payout ratio	91%	43%	11%
Capability	Dumb terminal	Micro-computer	Desktop mainframe

SOURCE: INFORMATION SYSTEMS NEWS, MAY 19, 1980

FIG. 2

WORKSTATION FOR ADMINISTRATOR, PROFESSIONAL IN 1980



The cost of any activity that is labor intensive tends to rise faster than the general rate of inflation.

es, but also the rental of access devices, access charges to networks, and costs for using electronic mail services. Computer time charges for central computation and for central database services are included even though these can easily exceed the $200 to $600 per person per month that I have estimated.

Software purchases are amortized at only $1,000 per year. This assumes large-scale purchases shared among network participants. This estimate is also highly conservative. It is software that generates economic payback, not hardware. To create an environment characterized by high-performance people requires open-ended experimentation with a variety of software sources.

EXPENSES AS HIGH AS 12K

If, however, material improvements are expected in the productivity of managerial and professional employees, the $6,000 technology expense is at the low end of the range (for 1981-83 technologies) and could be closer to $10,000 to $12,000 per person if all shared network costs for central computing are fully allocated to each advanced user.

All of this presumes that no unusual expenses are incurred in improving office illumination, in rewiring the site for additional electric power, in increasing the amount of air conditioning, in providing improved acoustics in the office to reduce the noise generated by the new equipment.

If the workstation is installed in a typical manager's office with a standard desk, chances are that none of the furniture will be suitable for any extended stay in front of the vdt. An additional allowance of anywhere from $5,000 to $20,000 per person usually has to be made to take care of all of the office space and office furniture improvements.

Not all estimates of costs for proposed information technology projects are comparable. Some dollars are better than others. I have reviewed many budget proposals aimed at justifying investments in computer technology. They are usually backed up by elaborate feasibility studies to give them credibility. Pareto's Law (i.e., 20% of any cause explains 80% of any effect) certainly applies: 80% of the cost schedules of these studies are devoted to the most elaborate examination of computer equipment that will account for less than 20% of the total cost.

Shared services are given the barest minimum attention since they are considered fixed expenses. When considered at all they are treated as an estimated percentage factor applied to the costs of the purchases. Software and telecommunications estimates are rounded off to the nearest large number.

What receives the least analysis are the largest costs, those that are directly related to making the technology deliver its benefits. Office automation projects are dominated by user costs, or what I call organization costs.

Except for out-of-pocket fees for consultants, training, travel, and so forth, organization costs are for the most part disregarded because the technology is seen as an expense that is incurred anyway. Putting such costs down would presume that the extent of the users' involvement as well as the degree of the disruption of the business is known in advance. The preparation of office automation investment estimates involve even deeper biases. Computers, terminals, programming, and software can be isolated and classified within the conventional accounting system as investments. Users—people—are an ongoing expense. One does not mix investment numbers with expense numbers. The net effect is that management will probably never find out the actual costs of an information technology project.

In Fig. 2 I have understated the $5,000 organizational cost for the first year of placing an administrator or a professional in a computer networking environment. The estimated number is based on the assumption that perfection will prevail and that the project will succeed exactly as planned.

What contributes to organizational costs?

Initial training, which could take an average of three to six days, plus supplemental on-the-job training extending over a period of more than a month, to acquire operational competence can easily add up to $1,500 per person. The initial training cost must include the salary of the trainee as well as the costs of the trainers and of the training facilities.

HIDDEN STARTUP COSTS

Startup expense is conservatively estimated at $1,500 per person to cover a broad range of costs hidden in general overhead and in the lowered productivity that will occur during the transition from old methods. This figure includes inefficiencies in serving customers by new and unfamiliar means; job interruptions caused by unfamiliar new procedures; time spent in meetings with the peer group to negotiate changes in the handling of work; general management counseling; and the resolution of personnel questions affecting employee morale. The allowance of $1,500 is likely to be the lowest estimate that is acceptable, even for a well-run organization.

Two thousand dollars per person is budgeted for external support staff activities. The introduction of electronic workstations requires that consultants, central staffs, and all sorts of project support personnel become involved. Unlimited amounts of staff advice can be consumed in computerization of managerial and professional work. Organizational studies, methods analysis, security reviews, audit verification, and temporary assistance during conversion seem always to be needed in the transition from manual office work.

All of the above adds up to a sum of $11,000 for the first year's organizational and technology costs of bringing a typical administrator or professional into the electronic environment. This sum exceeds 30% of their annual full wage and salary costs. We must improve an individual's productivity by at least 30% just to break even. A 30% productivity improvement for administrators and professionals is hard to measure and, therefore, hard to find. This does not even take into account any of the risks, such as when runaway organizational costs obliterate any chance of favorable economic returns.

From a risk management standpoint, then, organizational costs are by far the most critical investment item. If a computerization project gets out of control, its technology costs are what remains controllable: they cannot exceed a well-defined limit. But under adverse conditions the organizational costs are not controllable because organizational costs do not have a recognizable upper limit.

In the event of a failure, such as in the case of a major job dispute, organizational costs will exceed technology costs by a large margin. Damage to customer service may be the greatest expense that will never show up explicitly in any investment analysis. Organized labor is becoming keenly aware of the negotiating leverage that mismanaged office automation projects hand over to them.

One of the most constructive ways of properly planning computer projects is to make data available about elements of organizational expense. For instance, the costs of systems support for handholding and for technical assistance can be determined from carefully monitored test installations. Realistic training time estimates are mandatory. There is a great deal of information that could be made available by pooling data about past training experiences under a variety of conditions. Such benchmark information would be valuable.

Sending employees to classes on company time at a company training center is the most expensive way of learning.

Most important, the risks of runaway organizational costs due to technical system failures cannot be tolerated. This is why information technology managers who are not risk takers will always prevail. It is in this environment that a conservative, but high-service, supplier will always receive the higher market share. The conservatives in the information technology race will always outlast even high-performance risk takers. Given enough time, the game of Russian roulette produces a certainty: death.

Management cannot delegate the task of choosing technology to information technology proponents, not to their own computer experts, and certainly not to equipment vendors. I am dismayed to see how frequently executives become excessive risk takers with computer projects on the assumption that spending money will deliver favorable results. The time is coming when investment conservatives will regain their confidence that this strange new electronic world is manageable. New methods will show that the fundamentals of good management apply equally to the economics of information work as to the economics of manufactured products. Using investments to generate improved profits should not be compromised by blind faith in the miracles of information technology.

BENEFITS ONLY IN LONG RUN

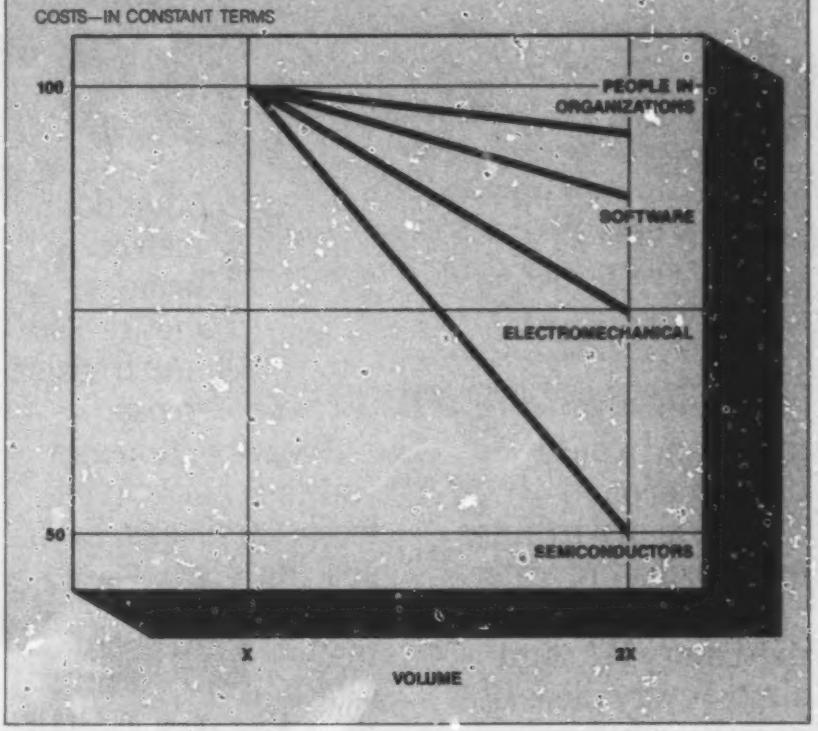
The cost of any activity that is labor intensive tends to rise faster than the general rate of inflation. Only accumulated experience in good use of capital investment can counter this trend. Due to heavy initial organizational costs, the benefits from most investments in information technology can be realized only in the long run.

There is a temptation to defer buying information technology to take advantage of the well-advertised declining prices of computer circuits. According to this theory, the current trend of a 50% unit cost reduction for semiconductors every time their production volume doubles should lead to a disappearing cost of hardware. This is not actually true because computer systems also contain electromechanical components, such as keyboards, printers, and disk drives. Systems also include software. None of these decrease in cost as rapidly as semiconductors. These trends are shown in Fig. 3.

Totally conservative reasoning that suggests deferral of investments in information technology projects is fallacious. As a matter of fact, such an approach will worsen the overall investment economics since the contribution of components, like memory and logic, represents less than 5% of the total cost of a system. Inflation in labor costs dominates everything.

FIG. 3

EXPERIENCE CURVE EFFECTS, BY ACTIVITY



The interesting economics of the various elements that make up a $10,000 per capita office automation budget reveal not only the overwhelming importance of organizational costs—made up entirely of labor expense—but also how varying rates of cost decline will influence the payoff from an office automation program (see Fig. 4).

Realizing a long-term payoff from information technology depends on the gains one obtains from people who have learned how to work more effectively. This takes a long time to accomplish. The gradual decline in organizational costs can be measured by the equivalent of the components learning curve. I call it the organizational learning or organizational experience curve. Time is the critical ingredient of success. One should never procrastinate in getting on with organizational learning unless labor costs are declining dramatically.

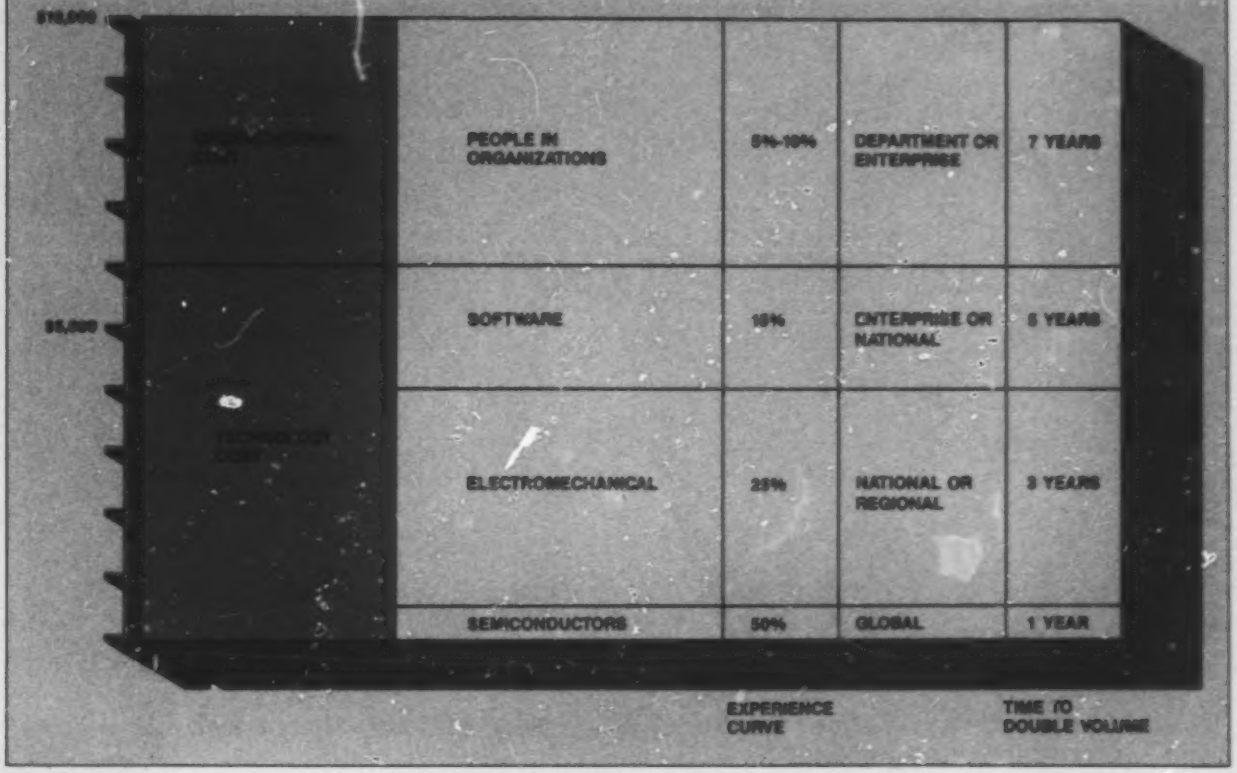
Because learning experiences are usually confined to isolated organizational units, such as to departments or plants, the organizational cost learning curve is inherently flat, probably not more than 5% to 10% per year. It is difficult to double experience if one starts small and remains small. Occasionally a project that has a national or even international scope is proposed as a way of accelerating the payoffs. These giant projects succeed only under the most unusual conditions. The essentially small, local scale of office automation projects dictates that the approach to implementation must be slow and gradual.

The rate of decline in organizational costs is also low because we are dealing with changing interpersonal relationships, with altering the division of labor, with reassigning office tasks and, frequently, with a subtle redistribution of power. For the first year's organizational costs to be minimized, organizational learning must proceed without any kind of organizational conflict. For these reasons, the prime responsibility of management on information technology projects is to cope with organizational issues rather than with technology issues.

To create the right environment for sharing organization learning, it will be necessary to create new standards for access to information sources.

FIG. 4

EXPERIENCE CURVE EFFECTS ON COSTS



MORE MONEY IN WORKPLACE

I think that to escape the squeeze between labor cost inflation and the limited ability of isolated organizations to transform themselves, the solution is to use greater amounts of learning capital in the workplace. This capital would be aimed at overcoming the effects of small-scale implementations of office automation by making it possible to bring about rapid sharing of best experiences from already successful sites. The solution to the problem of accelerated organizational learning lies in electronic networks, in electronic conferences, in on-line tutorials, and in on-line user support rather than in the traditional forms of classroom education, book learning, or improvised implementation assistance. If projects are proceeding too slowly, management should see to it that organizational learning, and not just technology, becomes transplanted in big doses through well-conceived imitation of the patterns of proven success.

My estimate of the expenses for the first year of automation do not include the elements that will increase with time: for every reduction in workstation prices there will be a corresponding increase in the use of remote services. Increased experience generates a greater volume of transactions. The volume of information has always grown as costs have come down. The costs of processing the increased volume has always exceeded cost reductions produced by better engineering. I see no reason why this phenomenon will not continue into the future.

I do not believe the current projections that the total costs of information technology, per person, can be expected to decrease. As a matter of fact, a tenfold greater growth in information industry revenues than the growth in information worker population is proof that per-capita expenses for information technology are growing very fast. Better information processing power, at lowered prices, will continue to be delivered indefinitely, but per-capita costs of information will soon equal payroll dollars. There will be no reduction in information technology expense as the result of decreased unit costs.

Organizational learning time can be dramatically reduced by an organizational design that balances decentralization with efficient use of shared resources. Shared databases, creation of industrywide cooperative projects, global division of labor, and lifting of regulatory boundaries are just a few of the many ways in which experience can be distributed to aid in purely local efforts. Organizational learning is also improved by giving employees incentives to acquire knowledge on their own rather than under company control. Sending employees to classes on the company's time at a company training center is just about the most expensive way of learning: laggards will be overstretched and potential overachievers will be held back in order to fit the standard teaching plan. Scheduling economics based on classroom capacity will also dictate that learning take place in the company of total strangers.

Until we have better insights into the behavioral aspects of people, organizational costs will be high.

Organizational learning involving the application of information technology is best accomplished at work, within the work group. The use of computers is a technical skill only to a very limited extent. It is increasingly a shared organizational capability. There is no better way to speed up organizational learning than for people who work together to learn together. This, of course, should not preclude individual remedial learning or individuals pursuing their own ambitions through supplemental education.

There are legitimate efforts to reduce organizational learning costs through standardization of all means of communication. There are equally valid reasons to enhance individual learning through customizing the devices that a person uses. I have seen many examples of applying forced uniformity in all hardware and software as a way to guarantee the sharing of learning experiences. There is a high price to be paid for such standardization: the pace of business is just too fast to tolerate uniformity at this stage of development. So far they have failed to achieve standardization in the functions of various computers.

SHARED LANGUAGE NECESSARY

To make it possible for organizations to share experiences electronically, the individuals must have at least a shared language. Database specialists, telecommunications protocol administrators, and software librarians are the agents for accelerating the distribution of information. To create the right environment for sharing organizational learning, it will be necessary to create new standards for access to information sources. It will be necessary to devise a completely new set of standards that will deal not with electronic pulses but with the linguistic habits of people who come from many different cultures, with people who have many different levels of skills in coping with the electronic medium.

Experience is not valuable to others if they cannot make use of it. Pilot programs, test installations, and experimental sites are popular methods for making cautious investments in computers. The most frequently given reason for this approach is financial limitations. A more realistic view is that managers are unsure of what they are getting involved with.

"Harold's taking a course in art appreciation. Our accountant says it's time we started a collection"

CARTOON BY HENRY MARTIN

Small is beautiful, but breaking things up can also create a mess. If the prevailing management style is to partition learning among small and isolated enclaves, then the economic gain from the cautious approach will be minimal. Each site would build up its own cumulative learning. The experiment would have limited value because high startup costs would not be amortized over a larger base. Unless central management arranges for a careful evaluation and then for rapid dissemination of the results of these experimental installations, the principal benefits of the cautious approach will be found in reducing the costs of replicating the experiment. I doubt whether that is worth the effort.

These isolated experiments may actually decrease the overall experience level in an organization. Turnover among expert personnel is uncharacteristically high after the completion of isolated pilot projects.

On balance, I favor concentrated, well-focused, and well-funded office automation projects that have limited objectives but that can be rapidly expanded with success. Likewise, such projects ought to be quickly canceled if they do not deliver results. The primary objective of such projects is to rapidly make people much more productive.

It is striking how much more will have to be known about the behavioral aspects of people successfully relating to computers before the existing risks associated with investments in information technology will decrease. Until better insights are gathered, organizational costs will remain high. Until organizational costs become reasonably manageable, the rate at which we can expect information technology to become accepted must be revised downward from present extrapolations.

The economics of office work are dominated by labor cost. When introducing information technology, organizational expense becomes the most important element. This should dictate how the investment is made. Managing the risks of organizational costs rather than technological costs, in addition to stimulating organizational learning, are the primary roles for management. ®

Paul A. Strassmann is vice president of systems applications for Xerox Systems Group where, among other duties, he assesses the effects of office automation. He was the chief computer executive for Kraft and General Foods, has taught at various institutions of higher learning, including Imperial College in London, and has published numerous articles on information management.

Because they're moved from department to department so often, most Japanese employees never become specialists.

JAPANESE DP

by Andrew Friedman and Joan Greenbaum

In Japan, companies hire the person, not the skills. In fact, it can be the kiss of death to consider yourself a specialist in anything, even the most highly skilled computer jobs. Many companies practice a formal system of job rotation for almost all white-collar workers to train entire staffs as generalists. This company policy also applies to data processing, though often with important modifications.

These findings emerged from a survey of data processing managers (DPMs) in Japan. Thirty-seven DPMs were interviewed face-to-face for between three and six hours. The survey is part of a large international project comparing dp departments in Japan, Europe, and America (see box). Striking differences between the organization of Japanese and Western computer departments include the following features:

- At 82% of the Japanese data processing departments, over 90% of the new recruits are hired straight out of high school or universities, though none of the Japanese data processing managers expected a computer science degree from a new programmer, compared with 19% in the U.S. and 14% in Europe.
- In fact, Japanese DPMs have very little control over the choice of new staff. In 57% of the firms, the choice of who comes to the dp department is made by the personnel department alone. No dp staff members participate in the decision at all. Such extreme lack of control over staff was found in only 2% of American and 8% of European data processing departments.
- Not only do Japanese DPMs have little control over whom they hire, but salary levels and promotion decisions concerning dp staff are often made outside of the dp department. In America, 18% of the DPMs said that decisions about salary changes were made outside dp, compared with 86% in Japan. Decisions about promotions were made outside dp according to only 7% of the American DPMs, compared with 36% of their Japanese counterparts.
- Job rotation schemes existed in 75% of the Japanese firms studied. Staff members were also rotated into and out of the dp department in 70% of the firms, though in two-thirds of these companies, dp staff were rotated more slowly than other staff.
- One result of these rotation schemes was the very high proportion of Japanese DPMs who came to their positions from some other department within the company. In the West, most come from a dp background, either from within the company or from outside. Of the Japanese DPMs, 56% came from nondp positions within the company, compared with only 15% in Europe and 11% in the U.S.
- The Japanese employ a high proportion of contract staff, but these people rarely get high status jobs in the dp department. Most often, contract staff are operators or programmers rather than systems analysts. Their specialized work carries low status in Japan, their earnings are usually well below those of the permanent staff, and they suffer social disadvantages because of not "belonging" to their client companies.

"Only generalists are preferred in this company," said one Japanese DPM. "Every year, the personnel department hires freshmen, some from universities and some from college. We in the computer department request so many new staff, but as for how many we can acquire, we can only hope. All are hired by personnel alone. No one from the computer department attends. Freshmen are trained by the personnel department for one month in general matters of the company. Then they are assigned by personnel to different departments."

It is a matter of general company policy throughout Japan to hire freshmen, that is, new graduates fresh from high school, college, or the university. Most of the DPMs (53%) reported that their company hires only freshmen, and another 29% reported that freshmen make up over 90% of new entrants. The model personnel policy to which almost all Japanese companies aspire is to hire new recruits as young as possible and mold them into the ways of the company for a prospective 30 or so years with the same firm. Recruits are not chosen for any specialized education, training, or experience that they may have acquired outside the company's control. Not one DPM expected a new programmer to have a computer science degree, though in 45% of the cases, some university degree was expected. General subjects such as law, philosophy, or economics are preferred from prospective white-collar staff (or salarymen as they are called in Japan).

COMPANY CONTROLS DP HIRING

New recruits in two thirds of the installations visited were chosen by the personnel department according to companywide requirements (see Fig. 1). Which of those recruits came to dp was also decided by personnel alone. In the other third of our cases, dp participated with personnel (or with a management committee in some smaller firms).

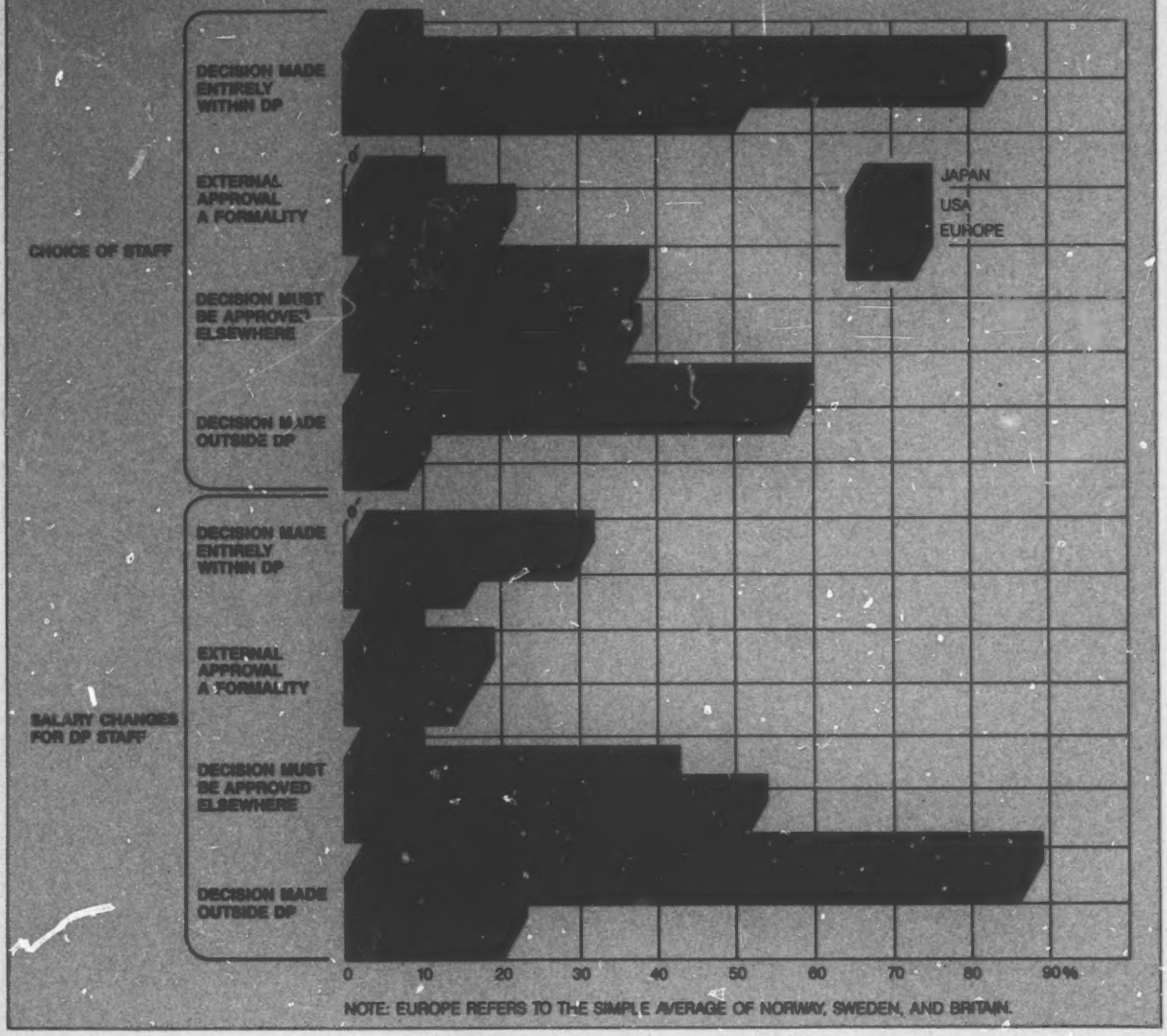
How does personnel decide which candidates to choose? In most cases, they select dp staff members according to which school or university they attended rather than what subjects they took. There is a strict and well-known hierarchy of educational establishments in Japan. Many companies maintain close links with only one university and recruit almost all new staff from that university. Personality and attitude are even more important factors governing selection of candidates. "Personnel looks for loyalty, harmony, and a fighting spirit, not technical skills," said one DPM.

As well as looking for the sort of people who will fit into the company culture, Japanese companies go to great lengths to shape new staff into the company mold. After they're hired, new recruits in all the companies we studied were given anywhere from two days to five months of general training (40% gave either two weeks or one month of general training). This was organized by personnel, and took place before the recruits knew which de-

ILLUSTRATION BY MEL FURUKAWA

FIG. 1

DPM'S CONTROL OVER DP STAFFING DECISIONS



NOTE: EUROPE REFERS TO THE SIMPLE AVERAGE OF NORWAY, SWEDEN, AND BRITAIN.

partment they'd be assigned to.

General training often involves psychological counseling or spiritual education along with vigorous physical exercises. This sometimes includes rally-type hikes, where recruits are broken into teams and are expected to learn the advantages of cooperation within the group, rather than competition. One DPM said the two weeks of training at their company was "very rigorous, with day and night training." Having gone through this initiation exercise, new recruits acquire a sense of community with the group recruited in the same year as themselves. Eventually this group will be scattered throughout the firm, but attachments formed on initiation often remain, much as students continue to socialize with their age peers even after they scatter to take different subjects. Often, members of the same recruitment year go drinking together. Such horizontal links by age across departments of the Japanese company can be invaluable for breaking down communication barriers between departments. It may mean that one of the greatest problems for dp in the West—good multilevel communication with users—is less of an issue in Japan.

The interviews in Japan usually began between 1 and 2 p.m. and lasted until 5 or 6 p.m. Many times, the team of interviewers would end up in a drinking spot after an interview. These bars, called akachochin, served food as well as drink. They were always appointed with a series of booths or small rooms for parties of up to five or six people. There we observed considerable multilevel communication among Japanese white-collar staff. Project leaders or DPMs often take members of their staff to akachochin after work. In addition, staffs from different departments who were in the same year at the same university regularly finish their long day at akachochin. People who belong to the same company-sponsored clubs or sports teams also go to akachochin with one another. Surprisingly, we also observed extremely high level executives together in booths with very junior staff members.

Sometime between 9 and 11 p.m., they roll out of akachochin and head toward one of Tokyo's myriad subway stations. Then they are literally stuffed onto subways that speed them out to the suburbs. Often, groups of three or four men, covering an age range of over 30 years, all with the same company pin, could be seen laughing and joking together like students,

as they tried to prop each other up to match the roll and sway of the last subway of the night. During the week it is rare for the Japanese salaryman to get home to his patient wife before 10 p.m.

SOCIAL DRINKING SUPPORTED

Going to akachochin is not a haphazard activity. It is normal company policy to encourage different combinations of staff to finish their day at akachochin. This rather pleasant extension of the normal working day is but one method for achieving harmony, loyalty, and a fighting spirit. Another method is the way departments are laid out.

Every data processing department we saw was completely open plan. Not only were there no separate offices (except for meetings and sometimes for reception of guests), but there were no partitions or cubicle walls. Very few staff members spent the majority of their time sitting at their own desks. The casual impression of most departments was that the computer staff did not work very hard. This was wrong. Several data processing managers emphasized the need for the staff to cooperate informally to get work done.

Once in dp departments, recruits learn the skills they need on the job or they are sent on short specialist training courses run by hardware manufacturers or training organizations like the Japan Productivity Center. These computer skills do not often find their way onto the labor market. For one thing, skilled staff are less likely to be laid off by large Japanese firms than by firms in the West. Japanese managers spend considerable resources developing the loyalty of staff toward their fellow employees and especially toward the company. They are less likely to respond to short-term market depressions by laying off staff because of the impossibility of replacing loyal cadres quickly when business improves.

Even if individuals are dissatisfied with the company, they cannot easily leave because there are relatively few attractive places for them to go. The larger companies pay the best wages, but they prefer to hire freshmen. Even smaller companies will prefer second-rate fresh graduates to people who have been socialized to be loyal to some other company (or people who show they are resistant to such pressures by voluntarily leaving a large company).

This is a problem for small companies. Until quite recently, large Japanese companies have grown very quickly, sucking up all the fresh graduates. Also, the number of freshmen available has begun to fall off because of a long-term trend toward smaller families in Japan. Smaller firms have found it difficult to recruit young staff. Some have been forced to take experienced staff who have left other firms, but usually all they can get are people who have left other small firms. Once hired by a large firm the pressures on a salaryman to stay there are compelling.

Salaries are closely tied to age in Japan. This is particularly true for large firms. For example, men in their early 20s working in the finance and insurance sector earn on average 14% more in large firms (more than 1,000 employees) than in small firms (10 to 99 employees). Men in their late 20s earn 27% more in large firms. By the time freshmen have acquired skills that might be marketable, they will have to give up a high salary in a large firm to go to a small firm that takes experienced recruits. This is likely to mean much worse fringe benefits as well as lower wages and poorer promotion prospects. This ties people closely to the company.

Within such large companies, the knowledge that he is likely to be there for the whole of his working life alters the Japanese salaryman's attitude toward his company, his colleagues, and any skills he may acquire. He does not go to a large company to learn a trade or a profession; instead, he enters a long-term social network.

FAMILY IMAGE NO JOKE

The image of the company as one big happy family is often viewed as a rather transparent piece of top management strategy in the West, but in Japan the image is much more convincing. In the West we hear of Japanese workers singing the company song first thing in the morning and listening eagerly to pep talks from supervisors. We think of it as a joke, or at least as evidence of how easily Japanese workers are duped. But the large companies provide something close to lifetime employment as well as certain all-important welfare provisions (such as health insurance, unemployment insurance, and pensions) that are available on only a limited basis through the Japanese government. Under these circumstances, it is not surprising that most dp staff regard their time in dp as just one stint in a part of the company, rather than an opportunity to acquire a valuable skill.

Besides hiring generalists and giving them general training at initiation, most large Japanese firms frequently rotate staff among departments. Three quarters of the DPMs interviewed said that a system of job rotation was a general policy for salarymen in their company. The frequency of rotation varied from every two to three years to every five to six years (54% of those that said they rotated staff did so every three to four years). Spending only three to four years in a department and then moving on to another encourages salarymen to view their future as depending on the company as a whole, rather than on departmental specialisms. Salaries and promotion in Japanese companies depend on a complex formula that includes number of years with the firm, evaluation by supervisors, and the rate of job rotation. Young men on their way to the top are those who are rotated fastest. The ability to get along well in many different departments and the widest possible knowledge of the company are the keys to success. Herein lies a big problem for dp staff and a danger for Japanese companies.

Most would admit that it takes a good two to five years for a programmer to become reasonably proficient. Most Western DPMs look for at least two years of experience from any candidate for a programming job above trainee. Therefore programmers will only just be pulling their own weight after working in dp for three to four years. If they are then rotated out to some other department, most of the benefits of training them to program will be lost.

In fact this problem is recognized and tackled in most Japanese dp departments. Three quarters of the departments in companies with job rotation schemes either rotated dp staff more slowly than other white-collar staff (67%) or did not rotate dp staff out of data processing (7%). On average, dp staff were being rotated every seven to eight years. While this goes some way towards solving the problem of losing dp skills, it creates other problems.

The problem is, perhaps, most acute for the DPM. Many times, the DPM is not a computer specialist (see Fig. 2). Fifty-six

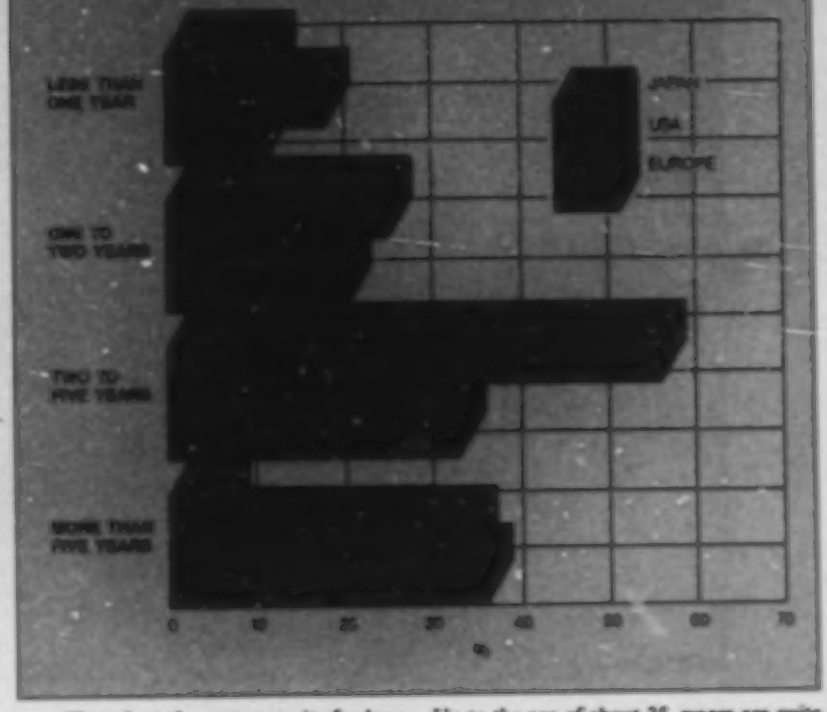
THE INTERNATIONAL SURVEY OF DPMs

The findings reported here are based on a survey of 331 data processing managers, including 37 from Japan, 199 from Europe (from Britain, Norway, and Sweden collectively), and 95 from the United States. In each country, senior level dp executives have been interviewed using a standard questionnaire. The interviews, often lasting more than three hours, were conducted by nationals of each country. The program is being funded primarily by the British Economic and Social Research Council, and the projects are being coordinated through the dp research project based at the Economics Department of the University of [illegible], England. Dp practitioners and researchers from the countries included in the program have formed the International Computer Occupations Network (ICON) to continue the research work.

Results from interviews conducted in the U.S. and comparisons with Europe were reported in two earlier issues of DATAMATION (see "Wanted: Renaissance People," Sept. 1, 1984, p. 134; and "The Challenge of Users and Unions," Sept. 15, 1984, p. 93). —A.J.

FIG. 2

HOW LONG HAS THE PRESENT DPM BEEN IN POST?



percent of the Japanese DPMs interviewed had come from nondp positions within the firm, (compared with only 11% in the U.S. and 15% in Europe). Most of these DPMs were high fliers in the company, rotating quickly into and out of dp on their way up the company ladder. Only 6% of the Japanese DPMs interviewed had been in that post for more than five years, compared with 34% in the U.S. and 36% in Europe.

Technical specialists in Western dp departments are often encouraged to develop their skills by DPMs who have risen from the ranks of dp. In Japan, it is difficult for the DPM to give this sort of technical guidance to young staff members because he himself lacks a dp background.

Slower rotation of ordinary dp staff hurts their chances of promotion and generally slows down their rate of salary increases. Even more important, dp staff members become specialists where the clear company culture is to prefer generalists. The social grouping circumscribed by the walls of the dp department becomes relatively more important than others. Dp staff risk losing their ability to see problems from a companywide perspective. They see changes in company policy in terms of the effects on dp and risk becoming defensive and inflexible. Fostering harmony, loyalty, and a fighting spirit with them becomes more difficult. They are in danger of becoming marginalized.

It is easier to establish harmony among a fairly homogeneous group of people. Apart from achieving homogeneity by choosing staff from a similar background (the same university) and molding them together in a similar way (general training by personnel departments, rotation schemes), another way is to carry out only similar work tasks within the company. This means farming out specialized work to suppliers or to contract staff.

Contracting out programming work is the solution that many Japanese firms have found. Half the companies interviewed had contracted out at least part of their programming and operations work. Some had contracted it all out. In these firms, the dp department contained only systems analysts (called systems engineers) who wrote specs for contract staff. Contracting work out can be thought of as another way of achieving harmony, loyalty, and a fighting spirit.

CONTRACT STAFF LOSES OUT

Contract staff are not hired as individuals; instead, work is subcontracted to a specialist company. This company then sends its staff to the customer. Staff from the subcontractor will work at the customer site for long periods. In fact, some examples were cited of subcontractors with 10 to 14 years on site. The prices paid to subcontract firms are often very low and this means that the people working on site from the subcontracting firm will be paid less than the permanent staff they work beside. Far worse than this is the social disadvantage in Japan of working for many years at a company to which you do not belong. The strong culture that binds employees to the company does not extend to contract workers. The advantages of sociability, company-sponsored sports facilities, outings, and after-hours drinking sessions in akachochin are not enjoyed by the contract staff. Nevertheless, they are subjected to the same pressures as permanent staff. On the occasions when interviews continued after 6 p.m., it was rarely observed that any of the dp staff—regular or contract—had gone home yet. When people eventually headed out to akachochin, contract staff didn't go.

The people who work for subcontract software houses were often spinouts from dp installations in large firms. They left the relatively comfortable embrace of a large company to pursue their computer specialities or because they did not fit into the company culture. Many, as in the West, quit because they believed they would earn more money in a smaller software house. Often, this is initially correct, especially if they left their original company after only three or four years in the dp department. Up to the age of about 25, wages are quite low even in large firms and the differential between large and small firms is small. It is only later that the disadvantages of working in a small firm in Japan became apparent: the lack of welfare provisions and a flatter age-wage profile.

Overall, the picture for specialized dp staff in Japan is problematic. Those who stay in dp in large companies have fewer promotion prospects than other white-collar staff. For those who spin out to a software house, the chances are good they will work for long periods at a customer site without the desirable social advantages of belonging to that company. Those most likely to succeed work for large companies, but stay in dp for only a short time. ●

Andrew Friedman teaches economics at the University of Bristol, England. He is the principal investigator of the study reported on in this article and author of the 1977 book, *Industry and Labour* (available in the U.S. through Humanities Press, Atlantic Highlands, N.J.) as well as several articles on work organization in computing.

Joan Greenbaum is an assistant professor of data processing at LaGuardia Community College in New York (CUNY). She is author of the book, *In the Name of Efficiency* (Temple University Press, Philadelphia, 1979), and often lectures on technology and social change.